

CLAIMS:

1. A method of constructing and thereafter installing at a direct smelting plant site a smelting unit comprising a direct smelting vessel, which method comprises the steps of prefabricating away from a predetermined location of the plant site for the direct smelting vessel, a base module and one or more further vessel modules to be brought together to form the vessel, each module comprising a circumferential vessel wall section formed of steel plate, transporting the prefabricated vessel modules to the predetermined location and depositing sequentially the base module and the one or more further vessel modules on top of one another and joining them together by one or more circumferential welds between successive circumferential wall sections of the modules to form a unitary direct smelting vessel.

2. A method as claimed in claim 1, wherein the weld is a continuous horizontal weld made on site after the modules to be connected have been deposited on top of one another.

3. A method as claimed in claim 1 or claim 2, wherein the further modules include an intermediate module and an upper module, the intermediate module being deposited onto the base module and connected to an upper part of the base module and the upper module being deposited on and connected to an upper part of the intermediate module.

4. A method as claimed in any one of claim 1 to claim 3 wherein a concrete foundation pad is pre-formed at the predetermined location to receive the base module.

5. A method as claimed in claim 4 wherein a series of load bearing members are located intermediate an external bottom surface of the base module and an upper surface of the concrete foundation pad to thereby enable

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air to flow between the base module and the foundation pad.

6. A method as claimed in any one of the preceding
5 claims, wherein the base module includes a hearth and a
forehearth for discharging molten metal.

7. A method as claimed in claim 6, wherein the
10 hearth and forehearth are lined with refractory bricks
after installation at the smelting plant site.

8. A method as claimed in claim 5, wherein the
intermediate vessel module comprises a generally
15 cylindrical barrel section provided with a tap hole for
discharging molten slag.

9. A method as claimed in claim 5 or claim 6,
wherein the upper vessel module is provided with an outlet
20 for off gases.

10. A method as claimed in any one of claims 4 to 9,
wherein at least one of the further modules is
prefabricated so as to be internally lined with water
cooling panels connected to water inlet and outlet
25 connectors on the exterior of the circumferential wall
section of that module.

11. A method as claimed in claim 5, wherein the
intermediate module and the upper module are both
30 prefabricated so as to be internally lined with water
cooling panels connected to water inlet and outlet
connectors on the exterior of the circumferential wall
sections of those modules.

35 12. A method as claimed in claim 10 or claims 11,
wherein the base module is also prefabricated so as to be
partially internally lined with water panels connected to
respective water inlet and outlet connectors on the

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exterior of the circumferential wall section of the base module.

13. A method as claimed in any one of the preceding
5 claims, which also comprises the steps of prefabricating
away from said predetermined location a plurality of tower
modules to be brought together to form a vessel access
tower, transporting the prefabricated tower modules to the
predetermined location and depositing them sequentially on
10 top of another and joining them together to form the
tower.

14. A method as claimed in claim 13, wherein the
tower modules are formed such that the tower extends about
15 the vessel at the completion of installation of the vessel
and the tower.

15. A method as claimed in claim 14, wherein at least
one pair of the tower modules is connected together at the
20 same level as the connection between a pair of the vessel
modules.

16. A method as claimed in claim 13 or claim 14,
wherein at least some of the tower modules are installed
25 before the vessel modules about which they are to extend
are installed, the latter vessel modules being deposited
downwardly into the interior of the installed tower
modules.

30 17. A method according to any one of the preceding
claims which also comprises the steps of pre-fabricating
off-gas ducting and treatment modules to be brought
together to form off-gas ducting and treatment apparatus,
transporting to site said off-gas ducting and treatment
35 modules and installing them in a predetermined order to
provide a continuous gas tight connection between an
outlet of the upper module and the off-gas ducting and
treatment apparatus.

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18. The method of claim 17 wherein at least one module comprises a wet scrubber with substantially vertical orientation and having an outlet disposed to receive a substantially vertical section of off-gas ducting.

19. The method of any one of claim 17 or 18 wherein said outlet of said upper module is disposed within a substantially vertical plane and connects with an off-gas ducting module disposed at an angle to a horizontal axis of between zero and fifteen degrees.

20. The method of claim 19 wherein said upper module is connected with said off-gas ducting module prior to installation whereby both said modules are installed onto said intermediate module as a single module.

21. The method of any one of claim 19 or 20 wherein said off-gas ducting module has an outlet remote from said upper module and disposed to receive a further off-gas ducting module extending vertically upwardly.

22. The method of any one of claims 17 to 21 wherein said off-gas duct comprises an off-gas ducting module arranged with a substantially inverted U-shape, each leg of said substantially inverted U-shape having an outlet for connection with a vertically extending off-gas ducting module.

23. The method of claim 22 wherein one of said outlets of said vertically extending off-gas ducting modules comprises an outlet of said wet scrubber.